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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MAZUMDAR, SONYA

ART UNIT

PAPER NUMBER

1791

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/508,917	Applicant(s) ASPAR ET AL.	
	Examiner SONYA MAZUMDAR	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,6 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6 and 8-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Addition of claims 15 and 16 are acknowledged.

Response to Arguments

2. Applicant's amendment, see page 3 in remarks filed January 28, 2008, with respect to claim 11, have been fully considered, and the objection of claim 11 has been withdrawn.

3. Applicant's arguments with respect to claims 1, 2, 3, 6, and 8 through 14 have been considered but are moot in view of the new grounds of rejection.

Furthermore, Sickmiller teaches weakening, or degrading, an adhesive bond (16) between a sub-assembly of devices (20a), or components, and an internal carrier substrate (18), or handle substrate, before actually breaking the bond (column 6, lines 6-10; Figures 8 and 9). As can be seen from Figures 8 and 9, the sub-assembly comprises of only selected components (20a) from numerous components (20), which are transferred to a target substrate (28). After transfer, some components remain attached to the carrier substrate for a later transfer to another substrate (column 6, lines 2-5). Thus, weakening the adhesive bond can only be performed on selected components to make for an easier transfer of those components only and avoid detachment of other components. As stated above, it is inherent to do so to in exposing the bond. However, if it not inherent, it would have been obvious to weaken the adhesive layer between the carrier substrate and devices to make removal of the carrier substrate from the target substrate easier after transfer of the components (column 5, lines 62-66; column 6, lines 6-10).

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Thus, the rejections are maintained in view of Sickmiller.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1, 2, 3, 8, 11 and through 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sickmiller (US 6,214,733) in view of Ghyselen et al. (US 2004/0050483).

With respect to claims 1, 2, 3, 11, 12, and 14, Sickmiller teaches a method relating to the transfer of thin film materials. Devices (20), or components, are formed on a first substrate (14, 24), or donor substrate, and are attached by an epoxy adhesive layer (26) to an internal carrier substrate (18), or handle substrate, (column 3, lines 62 – column 4, lines 16; Figures 2 and 3). The first substrate is then etched to expose the devices (column 4, lines 42-45; Figures 4 and 5). With the adhesive layer exposed and before breaking the adhesive bond between the intermediate carrier substrate, the adhesive

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bond is weakened by exposure to a chemical solution or UV light (column 6, lines 6-10). The internal carrier substrate and devices are bonded to a target substrate (28); and the internal carrier substrate is pulled away and thus removed (Figures 7-9).

Although Sickmiller does not expressly teach repeating steps of degradation of an adhesive bonding and placing the devices on further targets, Sickmiller does teach transfer of selected devices, where non-selected devices remain attached to the intermediate carrier substrate for subsequent bonding to another new substrate (column 1, line 66 - column 2, line 2; column 6, lines 2-4). Therefore, it would have been obvious, as taught by Sickmiller, to repeat the steps of weakening each device's adhesive bond to the intermediate carrier substrate and place the device(s) on a new target substrate as desired for patterning and alignment purposes on the target substrates.

Sickmiller teaches weakening the adhesive bond between the intermediate carrier substrate and the devices by chemical solution or UV light, before breaking the bond and pulling away the intermediate carrier substrate. Although the step of weakening the bond is not expressly stated to be performed prior to displacement on a target substrate, it is inherent to do so to in exposing the bond. However, if it not inherent, it would have been obvious to weaken the adhesive layer between the carrier substrate and device layer to make removal of the carrier substrate from the target substrate easier after transfer of the device layer (column 5, lines 62-66; column 6, lines 6-10).

Furthermore, Sickmiller does not teach bonding devices to a target substrate by direct molecular gluing. However, it would have been obvious to use direct molecular

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gluing instead of an adhesive layer, as Ghyselen et al. teach using molecular bonding as an alternative (paragraphs 0019, 0048, and 0061).

With respect to claim 8, Sickmiller teaches pulling away the intermediate carrier substrate from the devices, where means of physical separation can also be used (column 5, lines 62-66; column 6, lines 55-58).

With respect to claim 13, Sickmiller teaches a method of etching channels in a device layer to individualize the devices (column 3, lines 31-43; Figure 2).

With respect to claims 15 and 16, Sickmiller in view of Ghyselen et al. teach applying heat treatment as a finishing step to the area where molecular bonding takes place to reinforce the bond (Ghyselen: paragraph 0064 and 0074).

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sickmiller in view of Ghyselen et al., as applied to claim 1 above, and further in view of Roberds et al. (US 6,638,835)

The teachings of claim 1 are as described above.

Sickmiller does not teach creating access paths in the intermediate carrier substrate. Roberds et al. teach a device (12) is formed on a first substrate (16) and is attached by an adhesive polymer film (26) underneath a carrier substrate (28) with backside recesses (30) (column 3, lines 64-66; column 4, line 8; Figures 3 and 4).

It would have been obvious to create access paths, as Roberds et al. taught, and would have been motivated to do so for optional subsequent removal of the adhesive layer.

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5. Claim 9 are rejected under 35 U.S.C. 103(a) as being obvious over Sickmiller in view of Ghyselen et al., as applied to claim 8, and further in view of Rayssac et al. (US 6821376)

The teachings of claim 8 are as described above.

With respect to claim 9, Sickmiller does not teach a method of separating devices from a carrier by applying a fluid. Rayssac et al. teach separating a chip from a handle plate by means of a transfer fluid (column 9, lines 53-55; Figure 5E).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply a transfer fluid as Rayssac et al. taught and would have been motivated to do so as a separation procedure that does not require manual handling.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sickmiller in view of Ghyselen et al., as applied to claim 8, and further in view of Malloy et al. (US 5,455,202)

The teachings of claim 8 are as described above.

Sickmiller does not teach inserting a tapered object to assist with separation between devices and an intermediate carrier substrate. Malloy et al. teach a temporary substrate transferring a circuit to a second substrate, where the temporary substrate is removed thereafter by melting the adhesive wax layer by placing the assembly into a hot plate, and a tool is inserted between the temporary substrate and the device layer to be popped apart (column 5, lines 49-53; Figure 1).

It would have been obvious for Sickmiller to teach inserting a tapered object, as Malloy et al. taught, and would have been motivated to do so as another means of

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delaminating and physical separation of between the devices and the intermediate carrier substrate.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonya Mazumdar whose telephone number is (571) 272-6019. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SM

/Philip C Tucker/
Supervisory Patent Examiner, Art Unit 1791